RCL Circuits I

Name: _____ Section: 4BL-___ Date performed: __/__/__

Lab station: _____ Partners: _____

Circuit box #_____ Oscilloscope #_____

Part A

Measurements:

R_{gen} = _____ L = _____ C = _____

R_L = _____ (range :) R_{tot} = _____

Plot V_C vs. t on the next page.

	calculated	graph	cursors	% difference
τ (ms)				
f (kHz)				

Calculations:

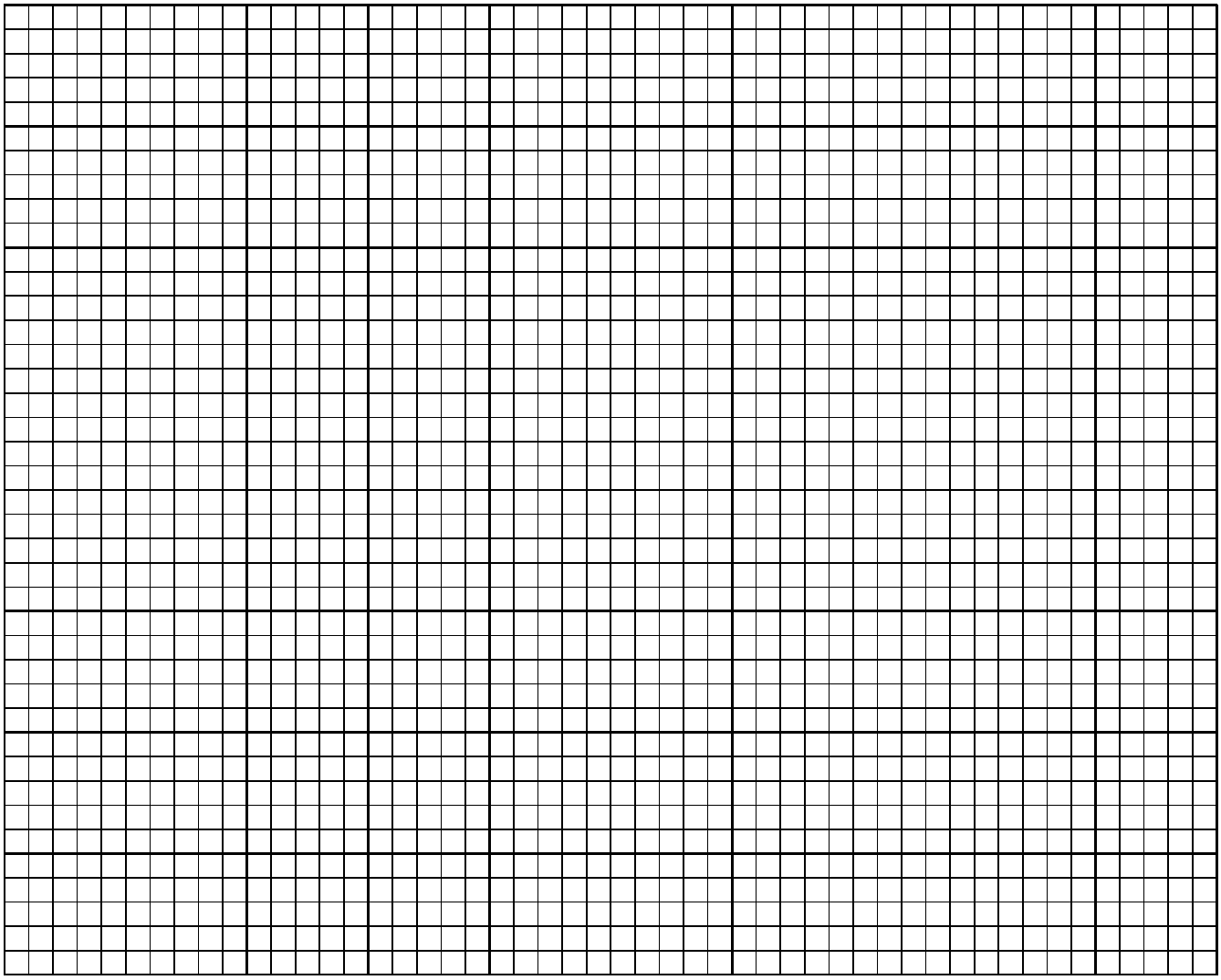
(Q-6) Does f depend on generator frequency? Explain.

(Q-7) How does f change with increasing C? Explain.

Draw circuit diagram:

V_C (Ch___): _____ V/div _____ s/div mode: DC / AC

Frequency dial = _____ Hz



Alternative measurement of τ (time permitting...)

The relationship between $V_C^{(\text{peak})}$ (capacitor voltage measured at one of the peaks) vs. time is given by a simple exponential:

$$V_C^{(\text{peak})} = V_0 e^{-t/\tau}$$

This is almost, but not quite, the same equation as the envelope function (slightly different V_0), but the time constant is exactly the same.

Show that the graph $\ln(V_C^{(\text{peak})})$ vs. t is a straight line and determine the slope of this graph in terms of τ:

Determine peak voltage values and times (use cursors):

t (ms)	$V_C^{(\text{peak})}$ (V)

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Attach $\ln(V_C^{(\text{peak})})$ vs. t graph from Excel.

$$\text{slope} = \_\_\_\_\_ \pm \_\_\_\_\_$$

$$\tau = \_\_\_\_\_ \pm \_\_\_\_\_$$

Calculations: